

Claims

1. A method for producing plants in which programmed cell death is controlled in the whole plant or plant-part thereof, comprising modifying the activity and/or expression of 2-oxoglutarate dehydrogenase-homologous protein in the cells of said plant or plant-part by inducing the occurrence of at least one mutation in the  
5 genotype of said plant or plant-part, and/or selecting plants having a mutation which modifies the activity and/or expression of 2-oxoglutarate dehydrogenase-homologous protein by using mutation-specific markers, activity assays and/or expression level assays, and propagating said plant.
2. Method according to claim 1, wherein said activity and/or expression is up-  
10 regulated.
3. Method according to any one of the preceding claims, wherein the promoter of the gene encoding said 2-oxoglutarate dehydrogenase-homologous protein is replaced.
4. Method according to any one of the preceding claims, wherein said occurrence of at least one mutation does not involve the insertion of foreign genetic material in  
15 said plant or rearrangement of genetic material within said plant.
5. Method according to any one of the preceding claims, wherein said activity and/or expression is modified in the mitochondria of said cells.
6. A plant, wherein the occurrence of programmed cell death is controlled by a method according to any one of the preceding claims.
- 20 7. A method for preventing programmed cell death in a plant or plant-part comprising providing the cells of said plant or plant-part with a polynucleotide construct, comprising a recombinant polynucleotide for overexpression of a 2-oxoglutarate dehydrogenase-homologous protein encoding gene, and which polynucleotide comprises in operable linkage:  
25 (a) a promoter that is functional in plants,  
(b) said 2-oxoglutarate dehydrogenase-homologous protein encoding gene,  
(c) a terminator, and, optionally,  
(d) a gene encoding a selectable or screenable trait operably linked to regulatory sequences for expression.

8. Method according to claim 7, wherein said 2-oxoglutarate dehydrogenase-homologous protein encoding gene is a heterologous gene.
9. Method according claim 7 or 8, wherein said promoter is an inducible promoter.
- 5 10. Method according to any one of claims 7 to 9, wherein said promoter is a tissue specific promoter.
11. A transgenic plant obtainable by a method according to any of the claims 7 to 10.
12. A polynucleotide construct, comprising a recombinant polynucleotide for  
10 overexpression of a 2-oxoglutarate dehydrogenase-homologous protein encoding gene, and which polynucleotide comprises in operable linkage:  
(a) a promoter that is functional in plants,  
(b) said 2-oxoglutarate dehydrogenase-homologous protein encoding gene,  
(c) a terminator, and, optionally,  
15 (d) a gene encoding a selectable or screenable trait operably linked to regulatory sequences for expression.
13. Polynucleotide construct according to claim 12, wherein said 2-oxoglutarate dehydrogenase encoding gene is fused to a mitochondrial signal sequence.
14. Polynucleotide construct according claim 12 or 13, wherein said promoter is an  
20 inducible promoter.
15. Polynucleotide construct according to any one of claims 12 to 14, wherein said promoter is a tissue specific promoter.
16. Vector comprising a polynucleotide construct according to any one of claims 12 to 15.
- 25 17. An *Agrobacterium* strain or any other microbial strain comprising a vector according to claim 16.
18. Transgenic plant comprising a polynucleotide construct according to any one of claims 12 to 15.
19. Method for producing a transgenic plant comprising introducing into the  
30 genome of a plant or plant-part a vector according to claim 16.
20. Method according to claim 19, wherein said vector is introduced into an ancestor plant, and wherein said transgenic plant is produced from said ancestor plant.

21. Method according to claim 20, wherein said vector is introduced into a plant-part to produce a transformed plant-part, and wherein said transgenic plant is regenerated from said transformed plant-part.